Risk Management

Safety & Environmental

Activities in Northern Waters

U.S. Minerals Management Service

MMS Risk Management

Presentation Outline

- Risk Management Defined
- Risk-Based Regulations
- Studies & Research Programs
- National Environmental Policy Act
- MMS Inspection Program
- Alaska OCS Challenges

Risk

Some Definitions…..

- Precise probability of specific eventualities
- Risk = Probability X Consequences
- The possibility of suffering harm or loss; danger
- A factor, thing, element, or course involving uncertain danger; a hazard
- The chance of injury, damage, or loss; hazard
- Uncertainty of Outcome

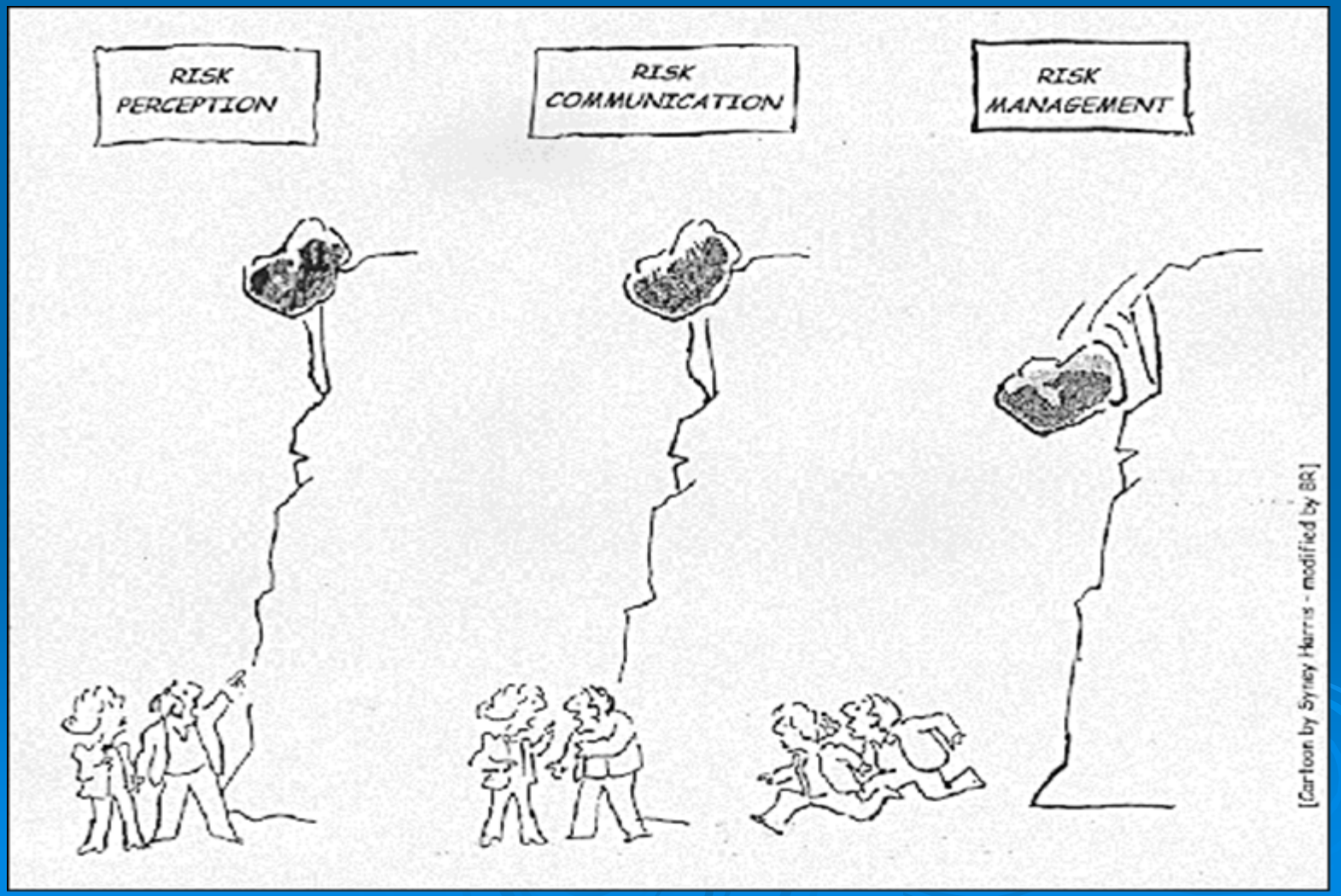
Risk Management Defined

Some Definitions…..

- The process of analyzing exposure to risk and determining how best to handle such exposure.
- Activity directed towards the assessing, mitigating and monitoring of risks.
- Policies, procedures, and practices involved in identification, analysis, assessment, control, and avoidance, minimization, or elimination of unacceptable risks.
- Assessing and quantifying operational risks, then taking measures to control or reduce them.

Risk Management Defined

Simply Defined…..



Risk Management Defined

Some Terminology…..

MMS Risk Based Regulations

Risk Management & Applied Knowledge

- Knowledge is Essential to Effective Risk Management
- Knowledge According to Webster:
  - ✓ the fact or condition of knowing something with familiarity gained through experience or association;
  - ✓ acquaintance with or understanding of a science, art, or technique;
  - ✓ the fact or condition of being aware of something;
  - ✓ the range of one's information or understanding
- MMS Regulation are Founded on Gaining and Applying Knowledge and Experience

MMS Risk Based Regulations

30 CFR Part 250

- MMS Regulations Impose Strict Requirements for Assessment of Risk: Risk Identification, Risk Analysis, and Risk Treatment
  - ✓ Hazards Identification
  - ✓ Probability of Failure
  - ✓ Consequences of Failure
  - ✓ Hazard Control & Mitigation
  - ✓ Compliance Monitoring

MMS Risk Based Regulations

U.S. Code of Federal Regulations

30 CFR Part 250

- Title 30 – Mineral Resources
- Chapter II – Minerals Management Service, Department of the Interior
- Subchapter B – Offshore
- Part 250 – Oil and Gas and Sulphur Operations in the Outer Continental Shelf

MMS Risk Based Regulations

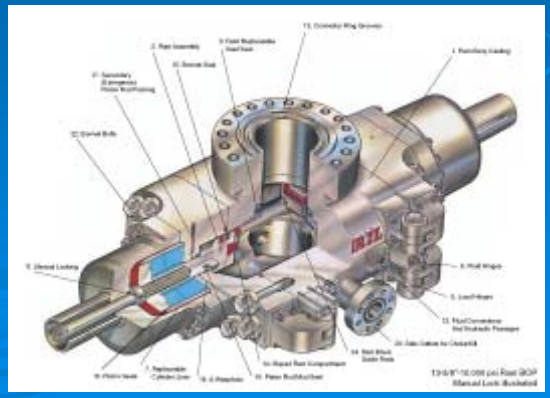
Subpart B - OCS Plans and Information

- Exploration, Development & Production Plans
  - Geologic & Geophysical Information
  - Hydrogen Sulfide Information
  - Biological, Physical, and Socioeconomic Information
  - Solid and Liquid Wastes and Discharges
  - Air Emissions Information
  - Oil and Hazardous Substance Spills Information
  - Environmental Monitoring Information
  - Mitigation Measures
  - Critical Operations and Curtailment Procedures

MMS Risk Based Regulations

Subpart D - Oil and Gas Drilling Operations

- Safety Requirements
- Permit to Drill Applications (APD)
- Casing and Cementing Requirements
- Diverter System Requirements
- Blowout Preventer (BOP) System Requirements
  (Includes Sub-Sea BOPs in Ice Scour Areas)
- Drilling Fluid Requirements
- Well Tests
- Training and Drills



MMS Risk Based Regulations

Subpart D - Oil and Gas Drilling Operations

- Mobile Offshore Drilling Unit (MODU)
  - Fitness Requirements - Drilling unit Capabilities
  - Foundation Requirements - Site Specific Soil/Oceanographic Conditions
  - Engineering Assessment - 3rd Party Review
  - Critical Operations & Curtailment Procedures
  - Classification Society - Operational Limitations
  - Contingency Plan
  - USCG Inspection
  - MMS Inspection

MMS Risk Based Regulations

Subpart H - Oil & Gas Production Safety Systems

- Addresses Production Safety Systems Operated in Subfreezing Climates
- Subsurface Safety Devices
- Design, Installation, and Operation of Surface Production Safety Systems
- Production Safety System Testing and Records
- Safety Device Training
- Safety and Pollution Prevention Equipment Quality Assurance Requirements
- Hydrogen Sulfide

MMS Risk Based Regulations

Subpart I - Platforms and Structures

- Industry Standards
- Platform Approval Program
  - Structural Integrity
  - Shallow Hazards Surveys
- Foundation Stability
  - Geo-Hazards
- Platform Verification Program
  - Certified Verification Agent (CVA)
- Inspection, Maintenance, and Assessment of Platforms
  - In-Service Inspection Requirements
  - Cumulative Fatigue Analysis Requirements

MMS Risk Based Regulations

Subpart J - Pipelines & Pipeline Rights-of-Way

- Design Requirements
- Safety Equipment Requirements
- Installation and Testing Requirements
- Maintenance and Repair Requirements
- Inspection Requirements

MMS Risk Based Regulations

Safety and Environmental Management System (SEMS)

- SEMS - MMS Proposed Rule
  - Four Elements Identified as Needing Improvement:
    - ✓ Hazards Analysis
    - ✓ Management of Change
      (Facilities, Procedures, Personnel, Work Practices, Equipment)
    - ✓ Operating Procedures
    - ✓ Mechanical Integrity
  - MMS analysis of accident & incident investigations determined that the root cause of most safety and environmental accidents and incidents are due to one or more of these four elements.

MMS Risk Based Regulations

Safety and Environmental Management System (SEMS)

- Incident Analyses
  - Study of 1,443 incidents revealed that
    - ✓ Management of Change: 108
    - ✓ Hazards Analysis: 185
    - ✓ Mechanical Integrity: 475
    - ✓ Operating Procedures: 481

- Incidents of Noncompliance (INCs)
  - MMS issued 3,132 INCs (2003 thru 2007)
  - 2,964 (95%) related to one or more of the four elements

MMS Risk Based Regulations

Safety and Environmental Management System (SEMS)

- Standards as Guides to Development of SEMS
  - API RP 75 - Development of a Safety and Environmental Management Program, for Offshore Operations and Facilities
  - API RP 14 C - Recommended Practice for Analysis, Design, Installation, and Testing of Basic Surface Safety Systems for Offshore Production Platforms
  - API RP 14J - Recommended Practice for Design and Hazards Analysis for Offshore Production Facilities
  - ISO 9001 - Quality Management Systems
  - ISO 14001 - Environmental Management Systems

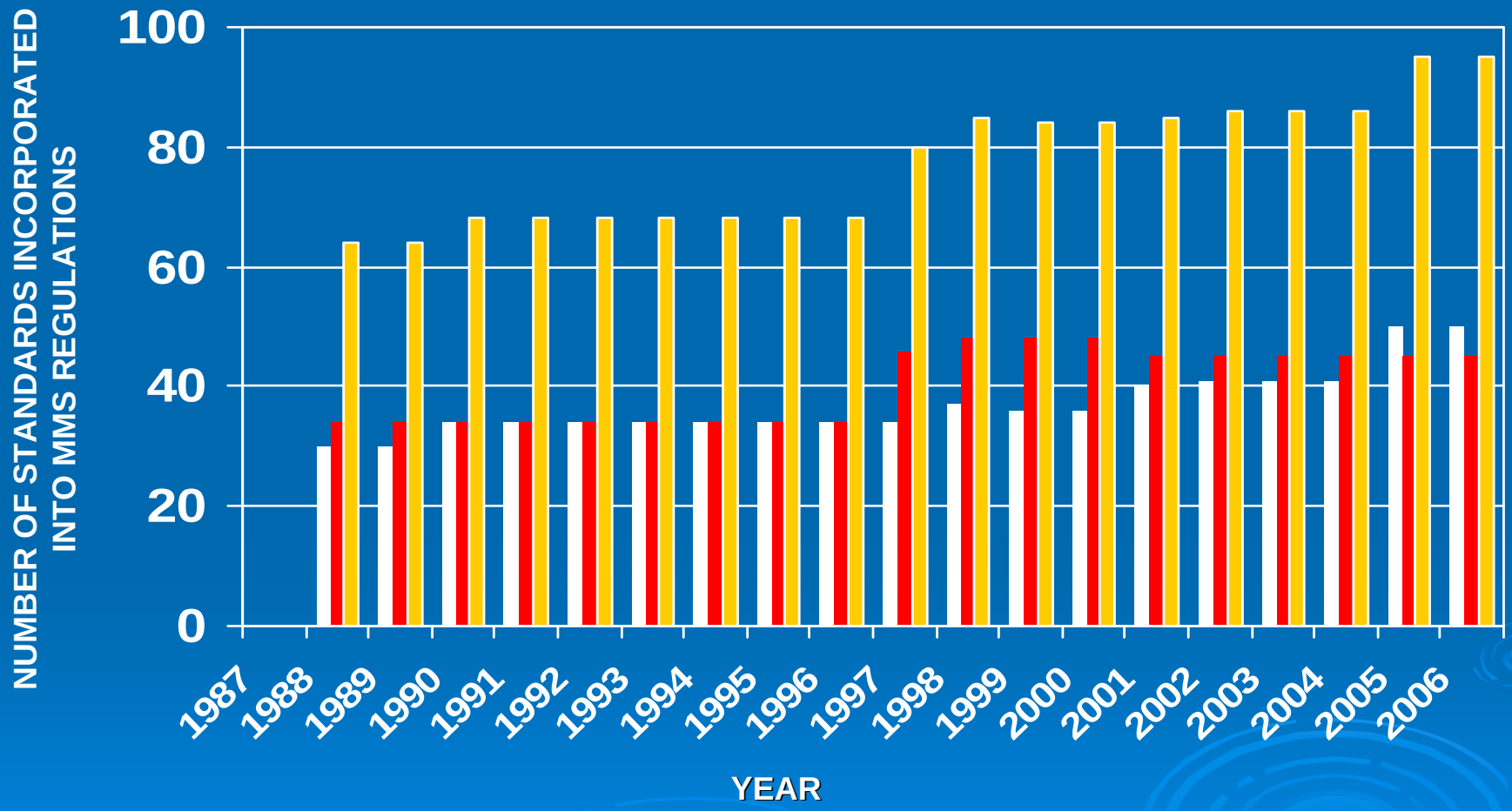
MMS Risk Based Regulations

Safety and Environmental Management System (SEMS)

- Scope of Application
  - All Operations (Drilling, Production, Servicing, Construction, etc.)
  - All Facilities (New and Existing; i.e., fixed, floaters, MODU)
  - DOI Regulated Pipelines
- MMS approval ***not*** required
- Lessee Develops & Implement SEMS and Has Available to MMS Upon Request
- RP 75 Incorporated Into MMS Regulations
- SEMS modeled after RP 75 and/or other standards that meet or exceed 75 (ISO 9001, 14001, etc.)

MMS Risk Based Regulations

Standards Incorporated by Reference



MMS Risk Based Regulations
Applied Industry Standards

- Standards Help Ensure Use of Best Available and Safest Technology in OCS Operations
- Adoption of Standard Often of Greater Benefit Than Developing a New or Revised Regulation
- Standards Provide Tool to Harmonize Requirements Between Multiple Agencies
- 93 Standards Referenced in MMS Regulations - Listed in 30 CFR 250.198
- Standards Organizations Referenced: API, ASTM, ASME, IEEE, ISO, IEC, IMO

MMS Studies & Research Programs

Risk Management Programmatic Tools

- **Technology Assessment & Research Program**
  - Operational Safety & Engineering Research (OSER)
  - Oil Spill Research (OSR)
  - Joint Industry Projects
- **Environmental Studies Program**
  - Physical Oceanography
  - Biological Sciences
  - Social Sciences

MMS Studies & Research Programs

Operational Safety & Engineering Research (OSER)

- Programmatic Tool Used to Assess & Manage Hazards/Risks of Offshore Oil & Gas Operations
  - Risk Assessment & Treatment Tool
- Provides Support for Regulatory Decisions
  - Science-Based Decision Making
- OSER Projects are Designed to Ensure Use of Best Available & Safest Technology
  - Regulatory Requirement – 30 CFR 250.107

MMS Studies & Research Programs

Operational Safety & Engineering Research (OSER)

- Total of 480 OSER Projects to Date
  - A single project can fall under multiple OSER project categories
- Joint Industry Projects (JIPs) = $15M
  - 188 OSER Projects
- OSER Funding = $58M Over 30 Years
  - ~ $150M Today's Dollars

MMS Studies & Research Programs

OSER Project Categories

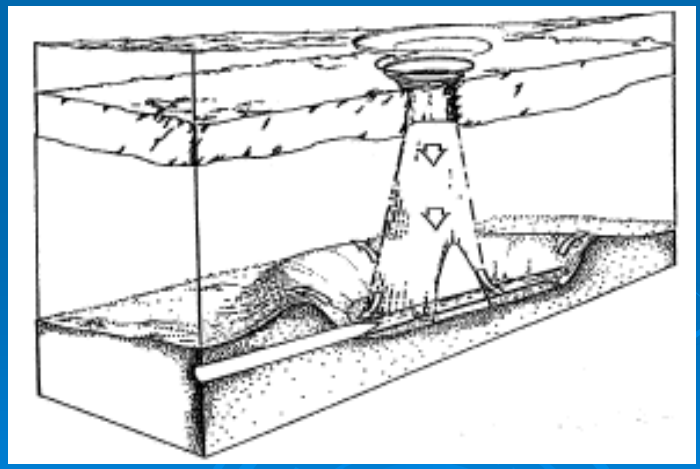
- Air Quality
- Arctic Research
- Decommissioning
- Deepwater
- Drilling
- Geotechnical
- Human Factors
- Hydrates
- Materials
- Moorings & Anchors
- OTRC
- Pipelines
- Production
- Product Measurement
- Seismic Research
- Structures

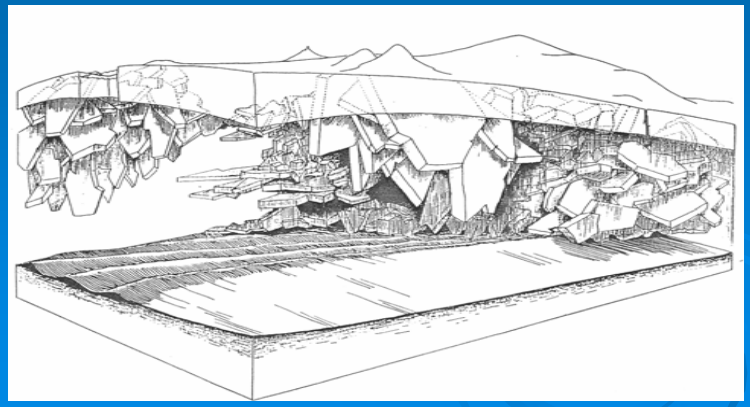
http://www.mms.gov/tarprojectcategories/

MMS Studies & Research Programs

Operational Safety & Engineering Research (OSER)

- Arctic Research (55 Projects) Includes
  - Ice Forces on Offshore Structures
  - Strudel Scour Effects on Pipelines
  - Ice Gouging of Sea Floor
  - Engineering Design Criteria





www.mms.gov/tarprojectcategories/ice.htm

MMS Studies & Research Programs

Alaska Environmental Studies - History & Scope

- Began in 1973; Over 400 Studies Completed to Date; $320M Spent Over 35 Years ($1.0 Billion Today's Dollars)
- Obtains Quality Scientific Information for Environmental Impact Assessments to Support Leasing Activities
- Multi-Disciplinary
  - Physical Oceanography
  - Biology
  - Social Science

MMS Studies & Research Programs

Alaska Environmental Studies - History & Scope

- Provides Monitoring for Environmental Changes
  - Beaufort Sea
  - Chukchi Sea
  - North Aleutian Basin

- Multi-Agency Collaboration
  - U.S. Geological Survey (USGS)
  - National Science Foundation (NSF)
  - Coastal Management Institute (CMI)
  - North Slope Science Initiative (NSSI)
  - National Marine Fisheries Service (NMFS)
  - National Ocean Partnership Program (NOPP)

MMS Studies & Research Programs

Environmental Studies Program

www.mms.gov/alaska/ess/index.htm

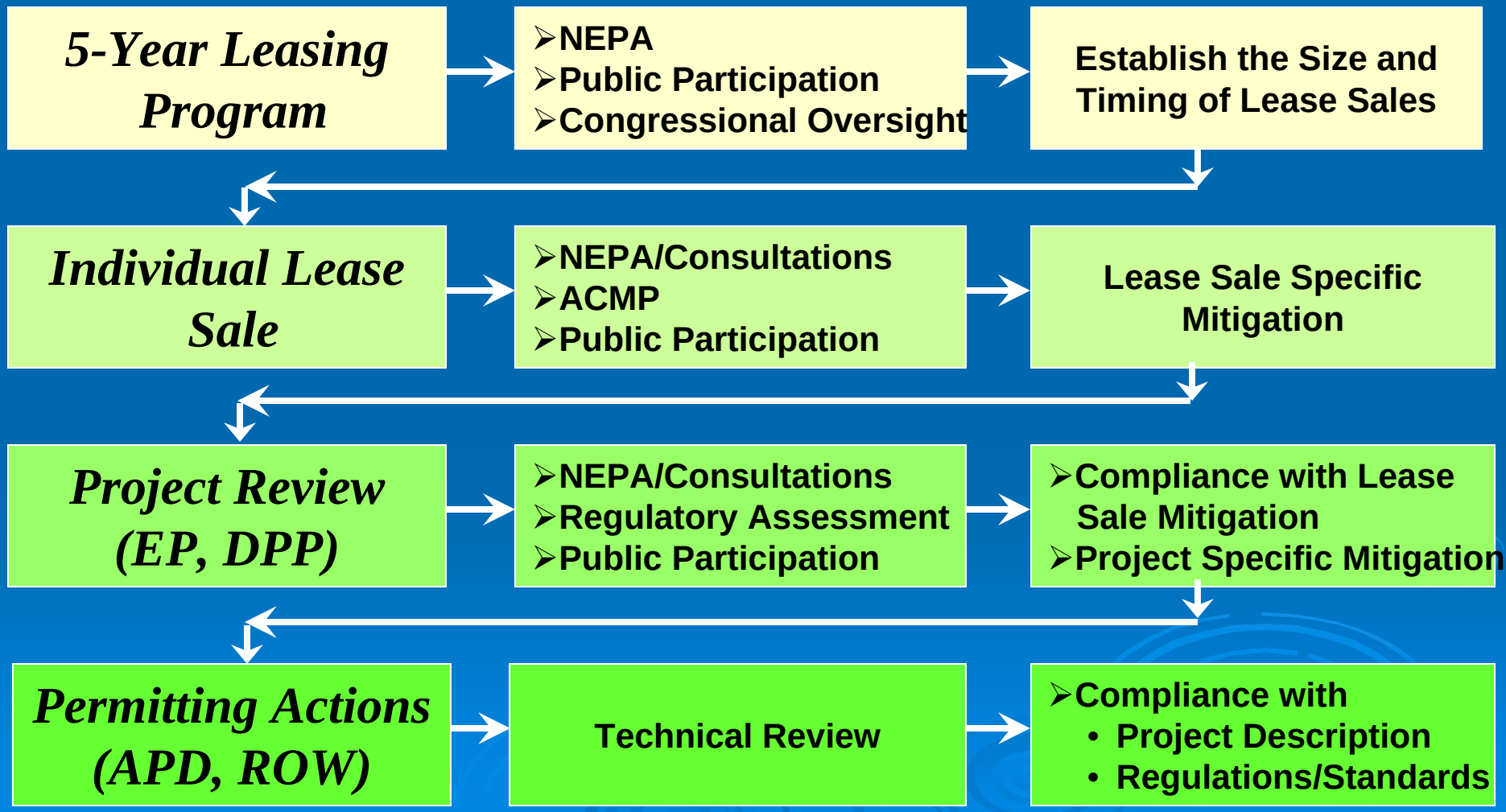
- Environmental Studies by Discipline (1997–2009)
  - Physical Oceanography – 33 Studies
  - Information Management – 25 Studies
  - Marine Mammals & Protected Species – 28 Studies
  - Fate & Effects – 20 Studies
  - Habitat & Ecology – 17 Studies
  - Social Sciences – 15 Studies
  - Multidisciplinary – 2 Studies

National Environmental Policy Act
NEPA - Process & Product

- Requirement to Analyze Effects of Major Federal Actions on the Environment
- Proposed Actions That Invoke NEPA
  - MMS: Lease Sales, Regional Analyses, Projected Activity Scenarios
  - Industry: Seismic Surveys, Exploration, Development & Production Plans; Action-Specific/Site-Specific Activities
- Provides for Public Notification, Involvement, and Comment – An Internal & External Process
- Provides for Informed Science-Based Decisions

National Environmental Policy Act

NEPA - Tiered Risk Management

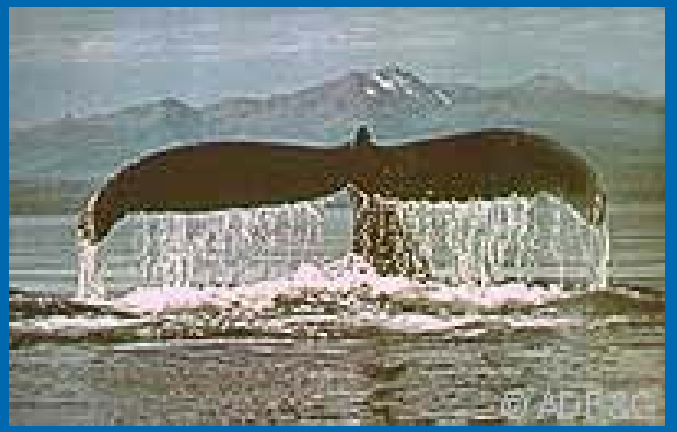


National Environmental Policy Act
NEPA - Risk Assessment & Treatment Tool

- Identify Issues
  - Potentially Affected Environmental Resources
  - Potential Conflicts (Resource Use, Cultural, Economic)
- Develop Alternatives to the Proposed Action
- Assessment of Potential Effects
  - Analyze Effects of Alternatives on the Environment: Includes Direct, Indirect, and Cumulative Effects
- Identify Information Sources
  - Environmental Studies, TARP, Academia, Industry, etc.
- Develop Mitigation Measures

National Environmental Policy Act
NEPA - Risk Communication & Consultation

- Consultations are Conducted Concurrently With the NEPA Process:



  - Endangered Species Act
    - ✓ Fish & Wildlife Service
    - ✓ NOAA
  - Essential Fish Habitat
    - ✓ NOAA
  - Coastal Zone Management Act: Consistency Determination
    - ✓ State of Alaska
  - National Historic Preservation Act
    - ✓ State Historic Preservation Officer

MMS Inspection Program

Regulatory Compliance - Risk Monitoring

- Inspection Criteria Developed Over 40 Years of Oil/Gas Experience and Incident Investigations
- Inspection Program Divided Into 13 Categories
- Each Category Broken Into Systems & Activities
- Each System/Activity Broken Into Multiple Inspection Criteria
- Each Inspection Criteria Directly Tied to Regulatory Citations

http://www.mms.gov/regcompliance/inspect.htm

MMS Inspection Program

Program Categories

- General
- Pollution
- Drilling Operations
- Well-Completion
- Well-Workover
- Decommissioning
- Production
- Pipelines
- Hydrogen Sulfide
- Cranes
- Electrical
- Personal Safety (USCG)
- Measurements & Site Security

MMS Inspection Program

MMS/USCG - Risk Communication & Consultation

- MMS & Coast Guard Collaboration (MOU)
- Systems-Based Jurisdiction & Inspection Program
- Scope: MODU, Fixed, and Floating Systems
- Minimizes Duplication of Effort & Promotes Consistent Regulation of OCS Facilities

MMS Inspection Program

MMS/USCG Systems-Based Inspection Program

- Design & Operating Plan
- Structural Integrity
- Floating Stability
- Station Keeping
- Drilling, Completion, Well Servicing, Workover
- Production
- Pipeline Operations & Components
- Lightering Equipment & Procedures
- Utility Systems
- Elevators for Personnel
- Aircraft Landing & Refueling
- Fire Protection
- Safety Systems
- Electrical Design & Equipment
- Aides to Navigation
- Communications
- Pollution Prevention
- Cranes & Material Handling Equipment
- Ventilation
- Life Saving Equipment
- Workplace Safety & Health
- Living Quarters
- Safety Analysis of Industrial Systems

MMS Alaska OCS Region

Challenges – Risk Communications

- Stakeholder Coordinated Communications
  - Industry
  - Government
  - Tribal Governments
  - Non-Governmental Organizations (NGO's)
  - Academia
  - Public
- Communicate MMS Risk Management Framework
  - Build Trust
  - Build Collaboration
- Develop Common Language and Terminology
  - Tradition-Based Knowledge
  - Science-Based Knowledge

MMS Alaska OCS Region

Challenges – Risk Management Framework

- Collaborative Government Oversight
  - Coordinated Regulations & Interpretations
    - ✓ MMS, USCG, NOAA, USFWS, EPA
- Safety & Environmental Management Systems
  - Operations & Maintenance - Keeping Track
- Records Management
  - Legal Challenges

THANKS FOR YOUR ATTENTION

Email: James.Lusher@mms.gov

Phone: (907) 334-5310

Agency Website: www.mms.gov